DRAFT: 2/22/22

Art-Sci Collaboration: Theory & Practice
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REASON

This course is offered as a unique opportunity for students in music and allied arts to broaden their exposure to interdisciplinary thinking and art-making practices ensuing from art-science convergence, a topic growing significantly in its visibility and range of activities today. It is also intended to be added to the list of options for School of Music students who are required to take courses in making creative work and as an elective for others. It is expected to be targeted towards upper-division undergraduate and graduate students and to be open for enrollment by students from across the Institute. Enrollment is to be by permission of the instructor after a brief interview.

SHORT TITLE (30 CHARACTER LIMIT)

Art-Sci Collaboration

LONG TITLE (40 CHARACTER LIMIT)

Art-Sci Collaboration: Theory & Practice

DESCRIPTION (400 WORD LIMIT)

Radical interdisciplinarity and a combination of theory and practice guide the principles of this course. It begins by exploring places where music, arts, and sciences may meet in deep theoretical territory. It examines how the forms of language used to describe presumably testable theoretical models in science and those experienced by makers in speculative arts can converge. It is also fundamentally about collaboration in thinking and making. The ultimate goal of the class is to manifest a collective class project proposing enrichment of human culture through creating original, unique work converging art, science, and technology. With a collaborative project effort supported by exposure to science theories, philosophies, and hybrid arts practices, it is anticipated that students will develop skill sets and vision to become interdisciplinary innovators, thinkers, and culture-makers. This course is for students with an interest in the idea of *homo universalis* or an inclination to *polymathy*.

During a sequence of lectures and seminars (with guest speakers), students will be exposed to ideas threading through arts and music, systems theory, experimental psychology, evolutionary biology, cosmology, telematic works, network theory, cybernetics, and more. One particular segment will focus on brain arts, its related aesthetic concepts, and technological toolkits (such as BCI). Looking into the future of arts practices, participants will also be encouraged to look into the past and to learn from ideas uniting the histories of arts, music, science, and technology development.

The course will culminate with students presenting an installation-experiment exploring the phenomena of *concurrent complexity*, a cybernetic, feedback concept looping emergent forms in multimodal stimulus environments with those detectable in the human brain and proprioceptive systems. (This concept will be described in detail during lectures.) Considered as an exercise in collaboration and an opportunity to apply what's learned in practice, this project may be regarded as a contribution of students themselves to the history of experimental arts – which may also help them develop their own artistic identity and situate themselves in time in relation to past, present, and future.

LEARNING GOALS

- Exposure to innovative practices across disciplinary fields in arts and sciences.
- Increase awareness of cross-disciplinary practices of art-science-technology convergence.
- Increase skills in analyzing new music and arts in related interdisciplinary practices.
- Learn how to design and realize an installation-performance as an experiment.
- Gaining experience in working on a project in a team.

COURSE OUTCOMES

- Students will have acquired the capacity to apply some of the hybrid practices discussed in class in their own creative practices as appropriate and relevant.
- Students will have increased knowledge of concepts derived from bio-cybernetics, emergent forms, and self-organizing systems across music, arts, and multimedia.
- Students will have completed a project that might be added to their artists' portfolios.
- Students will have acquired new skills in creating original works with methodologies they develop individually in the course.
- Students will have explored the interstices of arts and sciences emerging from speculative music and art making.

ASSIGNMENT TYPES

- 1st part of the course: Weekly reading assignments with reflections in written notes and participation in class discussions.
- 2nd part of the course: Creation of sketches, schemes, visuals, reflections, progress reports or other material documenting work on a collective class project related to the theme: *concurrent complexity – art installation and research experiment.*
- Final report: Article or review of the final class project presentation.

GRADING POLICY

In-class participation – 30%
Quality of weekly assignments – 30%
Final presentation – 15 %
Final report – 25 %

BIBLIOGRAPHY

What follows is a list of examples of publications from which chapters or other excerpts may be drawn for regular reading assignments. The class syllabus may eventually include an expanded list along with materials that may emerge to be relevant based on class discussions and students' individual interests.

Ascott, R. 2003. *Telematic Embrace, Visionary Theories of Art, Technology, and Consciousness*. (Berkeley, CA: University of California Press).

Deacon, T.W. 2013. *Incomplete Nature, How Mind Emerged from Matter*. (New York: W.W. Norton & Company, Inc.).

Fishwick, P.A. (ed.). 2006. *Aesthetic Computing*. (Cambridge, MA: The MIT Press).

Foerster, H. von. 1984. *Observing Systems*. (Seaside, CA: Intersystems Publications).

Fuller, R.B. 1975. *Synergetics, Explorations in the Geometry of Thinking*. (New York: MacMillan Publishing Co., Inc.).

Holland, J.H. 2014. *Signals and Boundaries, Building Blocks for Complex Adaptive Systems*. (Cambridge, MA: The MIT Press).

Jantsch, E. 1980. *The Self-Organizing Universe, Scientific and Human Implications of the Emerging Paradigm of Evolution*. (New York: Pergamon Press).

Mainzer, K. 2007. *Thinking in Complexity, The Computational Dynamics of Matter, Mind, and Mankind*. (New York: Springer).

Malina, F.J. (ed.). 1974. *Kinetic Art: Theory and Practice, Selections from the Journal Leonardo*. (New York: Dover Publications, Inc.).

Nijholt, A. (ed.) 2019. *Brain Art, Brain-Computer Interfaces for Artistic Expression*. (Cham, Switzerland: Springer).

Popper, F. 2007. *From Technological to Virtual Art*. (Cambridge, MA: The MIT Press).

Rosenboom, D. 2021. Illusions of form. In Impett, J. (ed.). *Sound Work: Composition as Critical Technical Practice*, 35-78 & 137-148. (Leuven, Belgium: Leuven University Press and Ghent, Belgium: Orpheus Institute).

Rosenboom, D. 2014. Active imaginative listening—a neuromusical critique. Frontiers in Neuroscience, Auditory Cognitive Neuroscience, The Musical Brain, 8, 1-7, DOI=10.3389/fnins.2014.00251.

Rosenboom, D. 2000. Propositional music: on emergent properties in morphogenesis and the evolution of music, essay, propositions, commentaries, imponderable forms and compositional methods. In Zorn, J. (ed.) *Arcana, Musicians on Music*. New York, NY: Granary Books/Hips Road, 203-232.

Rosenboom, D. 1990 and 1997. Extended Musical Interface with the Human Nervous System: Assessment and Prospectus. Leonardo Monograph Series, 1. (Berkeley, CA: International Society for the Arts, Sciences, and Technology). Revised version. (1997). (Cambridge, MA: The MIT Press, Electronic Journals, Leonardo Monograph Series, 1). [Online: http://www.davidrosenboom.com]

Rosenboom, D. 1975. *Biofeedback and the Arts: Results of Early Experiments*, (ed.). (Vancouver: Aesthetic Research Centre of Canada; and Hanover, NH: Frog Peak Music).

Scott Kelso, J.A. 1995. *Dynamic Patterns, The Self-Organization of Brain and Behavior*. (Cambridge, MA: The MIT Press).
Spencer-Brown, G. 1979. *Laws of Form*. (New York: E.P. Dutton).
Vitz, P.C. and A.B. Glimcher. 1984. *Modern Art and Modern Science, the Parallel Analysis of Vision*. (New York: Praeger Publishers).

ENROLLMENT RESTRICTIONS

No course prerequisites.
This course is open to BFA, MFA, and DMA students by permission of the instructor.
